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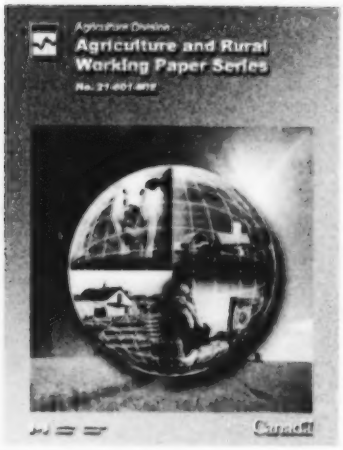
Provincial Trade Patterns



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Working Paper No. 58

Provincial Trade Patterns

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October 2002

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Abstract

In 1990 inter-provincial and international exports were about equal. By 1996, however, Canadian companies were exporting about $2 in goods and services to foreign countries for every $1 they exported between provinces. In 1990, Prince Edward Island, Nova Scotia, New Brunswick, Quebec, Manitoba and Alberta exported more to their provincial counterparts than to international markets. By 1996, all provinces except Prince Edward Island, Nova Scotia and Manitoba exported more internationally than they did inter-provincially. Inter-provincial trade patterns varied by province, but only modest changes occurred between 1990 and 1996. The effects of the Agreement on Internal Trade (1995) were yet to be seen. The interdependence of Ontario and Quebec was apparent.

Introduction

International exports have been an important source of national income since Canada's earliest beginnings. Trade between provinces, however, is also essential to the economy, and in 1990 inter-provincial exports were roughly equal to international exports. The purpose of this paper is to analyze the provincial trade landscape, and to examine the changes that have occurred in trade patterns between 1990 and 1996.

Prior to Confederation, the Canadian colonies were dependent on international exports as a source of income (and foreign exchange) that allowed them to purchase the machinery and equipment and other resources required to get established in a new country. Staple products such as fish, furs, timber, and wheat were exported to Europe and to the United States. When the border was closed and the Reciprocity Treaty with the United States cancelled in 1866, the colonies turned to each other for markets and for protection from American expansionism. They focussed their attention on confederation and nation–building, but continued to seek out foreign markets for their products. A tariff wall was erected around the fledgling manufacturing sector under the National Policy of 1879. Tariffs were subsequently increased in 1894, 1930, and again in the early sixties. This protective wall came down, however, in 1989 when the Free Trade Agreement reduced or eliminated the tariffs, and opened the borders to increased trade with the United States. Non-tariff barriers between provinces, however, remained, giving rise to the Agreement on Internal Trade (1995).

Canada was organized as a federal state with considerable powers given to the provinces, and during the 135 years since Confederation each province has evolved as a unique economic region. Each has taken advantage of its heritage of natural and human resources to develop an economy based on its own particular mix of products and services. The output is either consumed within the region, exported to other provinces, or exported to international markets.

The transcontinental nature and sheer size of our nation presents both opportunities and difficulties for producers. Trading within Canada has some advantages over international trade. It is not subject to exchange risk. It is subject to cultural and legal differences within Canada, but not those that exist between nations. On the other hand, for some industries inter-provincial trade is not that important because the domestic market is too small to absorb higher levels of production, and markets have to be found elsewhere for specific products such as wheat and pulp and paper. Also it may be more economical to ship products to destinations in the United States rather than across Canada because the shorter distance to market results in savings on transportation costs. For example, it may be more economical for Eastern Canada to import petroleum from off shore than to transport it from Alberta or Saskatchewan.

Economic background

During the early nineties, new trade agreements changed the 'playing field' for production and trade–the FTA, NAFTA (1994) and the Agreement of Internal Trade. New markets opened in the U.S. and Mexico, and producers were faced with stiffer competition at home. Fuelled by a low dollar and strong foreign demand, total exports increased by more than 11% per year on average between 1990 and 1996. In contrast, inter-provincial exports grew at an average annual rate of 2.3%. The rate of growth in international imports averaged 8.4% yearly.

In 1990, about three-quarters of Canadian merchandise exports were destined for the U.S. By 1996, this proportion had increased to 82% (Statistics Canada, 1999a). About 69% of total merchandise imports came from the U.S. in 1996, up from 66% in 1990 (Statistics Canada, 1999b). Exports of services to the U.S. remained constant at about 57% of the total, and imports from the U.S. fell slightly from 63% of total imports in 1990 to 62% in 1996 (Statistics Canada, 1996).

The impact that international exports have on the economy is revealed in the value added (or GDP) generated by exports alone, which was calculated on a provincial basis for 1990 and 1996 using Input–Output data and the IO algebraic model.[1] These estimates include both the direct and the indirect contributions to GDP. For example, the impact of Saskatchewan's wheat exports includes the direct impact on Saskatchewan's GDP plus the indirect contribution to the GDP of the producers and provinces which produced the inputs to Saskatchewan agriculture. These indirect suppliers would include accounting firms within Saskatchewan, energy producers from Alberta, and machinery and equipment suppliers from Ontario (Appendix B). GDP from all sources minus the GDP arising from exports gives "GDP from non-exports" (Table 1).

Despite the 1990/92 recession, strong growth in GDP characterized the period from 1990 to 1996 as GDP at factor cost grew at an average rate of 3.4% per year (Appendix A). The non-exporting sector was sluggish, however, relative to the international export sector. GDP generated by international exports (directly and indirectly) increased at an average rate of 10% per year, but that of the non-exporting sector grew at less than 2% a year due to weak domestic demand. The result was a dampening of inter-provincial trade.[2]

Table 1 – Average annual growth rates in GDP, 1990 to 1996[3]
(exports = international exports)

Province or Territory	GDP – all sources	GDP – non-exports	GDP – exports
CANADA	3.37	1.53	9.85
Newfoundland	2.00	1.48	**4.05**
Prince Edward Island	4.10	3.19	10.03
Nova Scotia	**1.87**	1.21	5.77
New Brunswick	3.32	2.98	4.48
Quebec	2.26	**0.29**	10.83
Ontario	3.18	1.07	10.29
Manitoba	2.51	1.38	7.73
Saskatchewan	4.30	1.77	10.52
Alberta	4.98	2.56	**12.07**
British Columbia	**5.02**	**4.23**	7.55
Yukon	-0.13	5.35	-8.88
Northwest Territories	2.65	3.21	0.36

Source: Statistics Canada, calculations based on Input-Output Division data, 1990 and 1996.

[1] See Appendix D for the definition of terms and the IO algebraic model.

[2] The structure of the IO model is such that the GDP arising from inter-provincial exports can not be calculated in the same way as for international exports without further modification, which is beyond the scope of this study.

[3] Data found in all tables and graphs in this paper were generated using Statistics Canada's provincial Input–Output tables for 1990 and 1996.

Inter-provincial and international exports

The growing importance of international exports can be seen in their share of GDP (at factor cost) (Table 2). In 1990, international exports comprised 27% of Canadian GDP, rising to 42% in 1996. In contrast, inter-provincial exports made up 24% of GDP in 1990 and 23% in 1996. International exports were particularly important to Ontario and Saskatchewan, while inter-provincial exports were essential for Nova Scotia, New Brunswick, and Manitoba.

Table 2 – Shares of GDP (per cent)

Province or Territory	International exports		Inter-provincial exports	
	1990	1996	1990	1996
CANADA	27.2	42.1	23.7	22.6
Newfoundland and Labrador	32.8	34.0	12.0	12.1
Prince Edward Island	13.8	20.7	28.9	**30.1**
Nova Scotia	17.7	23.9	22.8	24.4
New Brunswick	30.2	38.4	30.8	**36.2**
Quebec	22.1	36.9	24.8	22.4
Ontario	31.3	**51.4**	23.8	22.8
Manitoba	20.1	29.3	30.5	**33.5**
Saskatchewan	27.5	**43.6**	24.3	25.9
Alberta	24.9	38.2	28.1	26.3
British Columbia	27.9	34.4	15.5	13.9
Yukon	54.0	35.8	11.4	13.3
Northwest Territories	23.9	22.5	24.7	23.1

Source: Statistics Canada, calculations based on Input-Output Division data, 1990 and 1996.

Between 1990 and 1996 total Canadian international exports increased by 89%, while inter-provincial exports grew by a significantly lower rate of 16% (Table 3 and Figure 1).

In 1990 Prince Edward Island, Nova Scotia, New Brunswick, Quebec, Manitoba, and Alberta sold more products within Canada than they did internationally. Prince Edward Island, Nova Scotia and Manitoba continued to rely more heavily on internal markets than external ones in 1996, despite increases in international exports. Quebec focussed almost entirely on its international exports. Alberta became more reliant on its international exports which more than doubled during the period. The remaining provinces were more dependent on external markets than internal ones in 1990 and continued this trend into 1996.

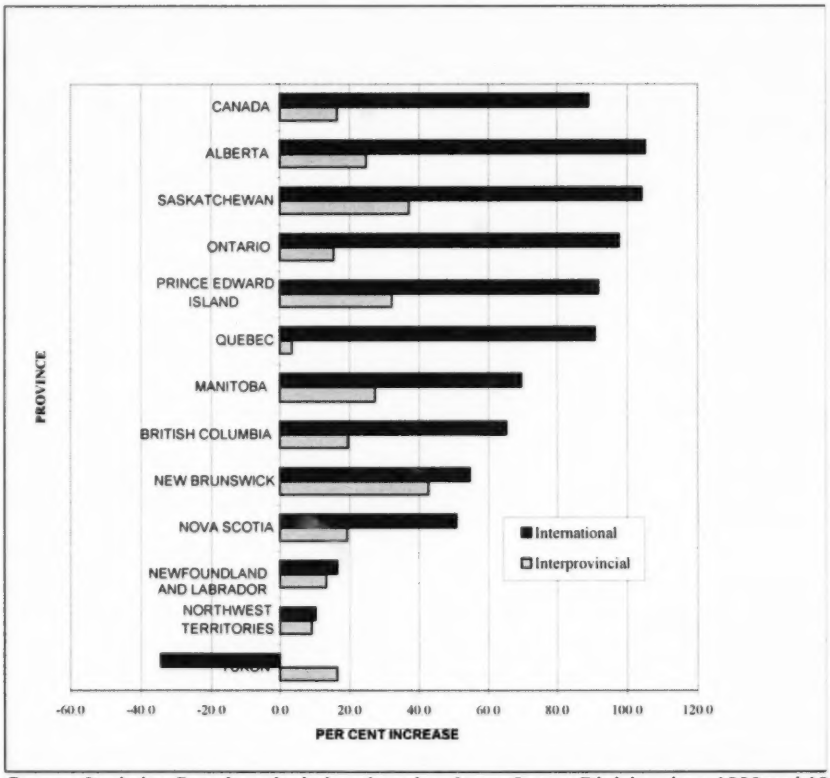
Ontario dominated both inter-provincial and international exports. In 1996 the province's $66 billion in inter-provincial trade made up 41% of total inter-provincial exports, and its $149 billion in international exports made up almost half (49%) of total international exports. In 1990, $33 billion in exports of motor vehicles, other transport equipment, and parts comprised 44% of Ontario's international exports, and $3.5 billion in inter-provincial exports comprised 6% of inter-provincial sales. By 1996, exports of motor vehicles, other transport equipment, and parts had increased to almost $59 billion, and made up 39% of international exports. Inter-provincial exports had grown to $5 billion, 7% of internal exports.

Table 3 – Inter-provincial and international exports, and % Increase, 1990 to1996
(current dollars, $000)

Province or Territory	Inter-provincial exports – 1990	Inter-provincial exports – 1996	Increase (%)	International Exports – 1990	International Exports – 1996	Increase (%)
CANADA	140,666,029	163,584,203	16.3	161,032,777	304,463,958	89.0
Newfoundland and Labrador	942,033	1,066,693	13.2	2,577,351	3,002,263	16.5
Prince Edward Island	554,037	733,608	32.4	263,594	505,691	91.8
Nova Scotia	3,391,697	4,050,563	19.4	2,627,942	3,970,358	51.1
New Brunswick	3,603,856	5,144,871	**42.8**	3,531,894	5,464,820	54.7
Quebec	33,259,627	34,342,616	**3.3**	29,708,019	56,686,551	90.8
Ontario	57,456,638	**66,291,642**	15.4	75,491,636	**149,368,283**	97.9
Manitoba	6,375,479	8,124,013	27.4	4,188,425	7,103,576	69.6
Saskatchewan	4,738,732	6,496,869	37.1	5,356,630	10,928,371	104.0
Alberta	18,833,340	23,550,963	25.0	16,677,944	34,212,497	**105.1**
British Columbia	10,882,557	13,029,084	19.7	19,511,928	32,283,652	65.5
Yukon	119,815	139,292	16.3	569,821	375,159	-34.2
Northwest Territories	506,176	552,426	9.1	488,432	538,286	10.2

Source: Statistics Canada, calculations based on Input-Output Division data, 1990 and 1996.

Figure 1 - Inter-provincial and International Exports



Source: Statistics Canada, calculations based on Input-Output Division data, 1990 and 1996.

The growing importance of international exports to Ontario's economy is further illustrated in the ratio of international to inter-provincial exports (Table 4). For every dollar of internal exports, Ontario exported $1.31 to international markets in 1990. By 1996, the province exported $2.25 internationally for every dollar's worth of products exported to other provinces.

A strong shift to foreign markets also occurred in Quebec, where inter-provincial exports increased by a meager 3%, reducing Quebec's relative share of the domestic market from 25% of inter-provincial exports in 1990 to 22% in 1996. International exports increased by about 91%. For every dollar of internal exports in 1990, international export sales were 89 cents. By 1996, international exports were valued at $1.65 per dollar of inter-provincial exports (Table 4). International sales of $15 billion in "other manufactured goods" (including metal products) in 1996 led Quebec's increase in international exports.

In 1990, for Canada as a whole, international exports were about equal to inter-provincial exports, but by 1996, the ratio of international to inter-provincial exports increased to almost 2 to 1.

Table 4 – International to inter-provincial export ratio

Province or Territory	1990	1996
CANADA	1.14	1.86
Newfoundland and Labrador	2.74	2.81
Yukon	4.76	2.69
British Columbia	1.79	2.48
Ontario	1.31	2.25
Saskatchewan	1.13	1.68
Quebec	0.89	1.65
Alberta	0.89	1.45
New Brunswick	0.98	1.06
Nova Scotia	0.77	0.98
Northwest Territories	0.96	0.97
Manitoba	0.66	0.87
Prince Edward Island	0.48	0.69

Source: Statistics Canada, calculations based on Input-Output Division data, 1990 and 1996.

When the export commodities were aggregated into goods and services, a different pattern emerged for inter-provincial and international exports. About 40% of inter-provincial exports were services, while half of that proportion (20%) of international exports were services. The service sector facilitates the marketing and distribution of goods, and includes wholesaling and retailing, finance, transportation and communications, and increasingly business and computer services.

International and inter-provincial imports

The degree of foreign penetration into our markets is shown in the import figures. For Canada as a whole the volume of international imports exceeded that of inter-provincial imports in both 1990 and 1996 (Table 5 and Figure 2). In 1990, this relationship held only for Quebec and Ontario. In 1996, Quebec and Ontario and also British Columbia imported more from external sources than from their provincial counterparts.

The fastest rate of growth in international imports was recorded in the four most western provinces and the Northwest Territories, led by Saskatchewan. The increases in foreign purchases were in machinery and equipment, chemical products, motor vehicles, and "other manufactured goods."

Ontario imported more than any province from abroad. Its imports were 52% of total Canadian imports in 1996, up from 50% in 1990. International imports of motor vehicles and parts increased by $15.5 billion to

$38.2 billion, and imports of "other manufactured goods" increased by $11.3 billion to $26.2 billion in 1996. Motor vehicles and parts made up 27% of Ontario's imports in both 1990 and 1996.

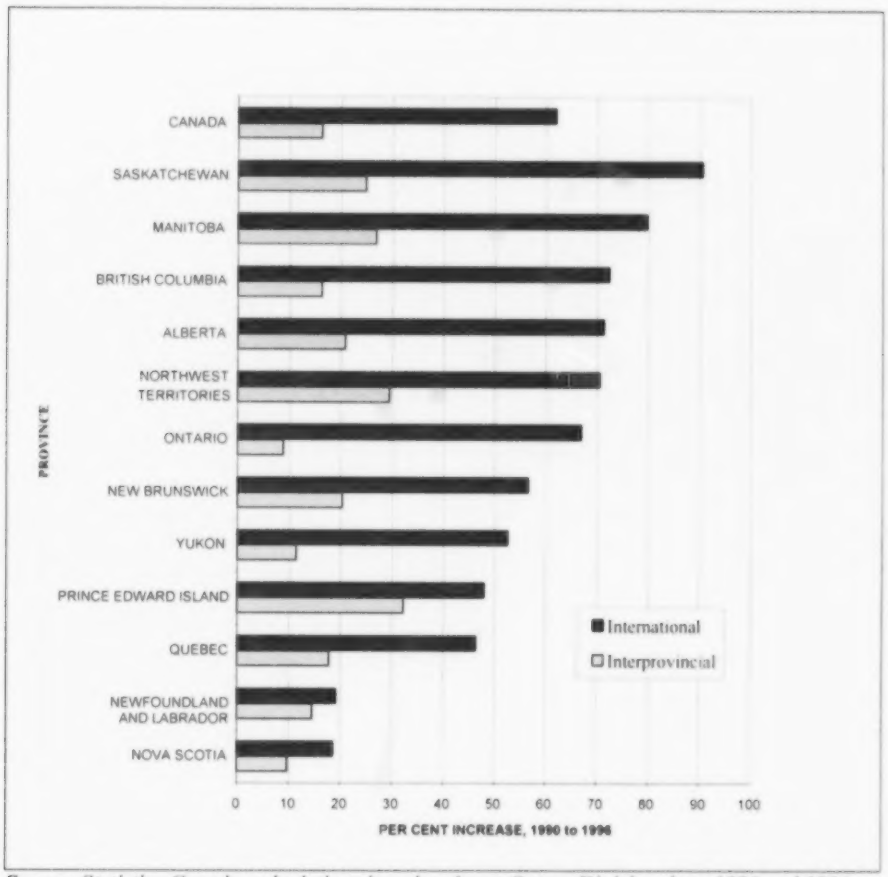
Ontario was also the largest importer of the provinces. Its inter-provincial imports were 25% of the total in 1996, down from 27% in 1990.

Table 5 – Inter-provincial and international imports and % increase, 1990 to 1996
(current dollars, '000)

Province or Territory	Inter-provincial Imports – 1990	Inter-provincial Imports – 1996	Increase (%)	International Imports – 1990	International Imports – 1996	Increase (%)
CANADA	140,484,159	163,560,544	16.4	166,897,957	270,442,450	62.0
Newfoundland and Labrador	3,653,654	4,189,061	14.7	1,925,899	2,297,962	19.3
Prince Edward Island	1,058,597	1,400,736	**32.3**	254,177	376,312	48.1
Nova Scotia	6,452,615	7,082,405	9.8	4,290,802	5,093,910	**18.7**
New Brunswick	5,456,874	6,570,363	20.4	3,624,816	5,681,098	56.7
Quebec	30,647,190	36,146,442	17.9	37,225,322	54,525,618	46.5
Ontario	37,231,849	**40,529,835**	**8.9**	83,654,198	**139,748,935**	67.1
Manitoba	7,167,862	9,095,469	26.9	4,099,314	7,371,243	79.8
Saskatchewan	8,152,837	10,183,135	24.9	3,269,514	6,232,693	**90.6**
Alberta	20,252,197	24,492,391	20.9	12,238,929	20,994,667	71.5
British Columbia	18,899,439	22,004,742	16.4	15,994,440	27,592,640	72.5
Yukon	505,666	563,692	11.5	110,064	168,047	52.7
Northwest Territories	1,005,379	1,302,273	29.5	210,482	359,325	70.7

Source: Statistics Canada, calculations based on Input-Output Division data, 1990 and 1996.

Figure 2 – Inter-provincial and International Imports, 1990 to 1996



Source: Statistics Canada, calculations based on Input-Output Division data, 1990 and 1996.

Imports

For all provinces and territories–and, of course, for Canada as a whole–the international to inter-provincial ratio for imports increased between 1990 and 1996 (Table 6). The ratio in Ontario increased from 2 to 1 in 1990 to more than 3 to 1 in 1996.

Table 6 – International to inter-provincial import ratio		
Province or Territory	1990	1996
CANADA	1.20	1.66
Ontario	2.25	3.45
Quebec	1.21	1.51
British Columbia	0.85	1.25
New Brunswick	0.66	0.86
Alberta	0.60	0.86
Manitoba	0.57	0.81
Nova Scotia	0.66	0.72
Saskatchewan	0.40	0.61
Newfoundland and Labrador	0.53	0.55
Yukon	0.22	0.30
Northwest Territories	0.21	0.28
Prince Edward Island	0.24	0.27

Source: Statistics Canada, calculations based on Input-Output Division data, 1990 and 1996.

As in the case of exports, there was a significant difference in the composition of inter-provincial and international imports. Almost 17% of international imports were services during both 1990 and 1996, while 40% of inter-provincial imports were services during 1996 (41% in 1990).

Inter-provincial trade patterns

The economy may be divided into four trading blocks – A) the Atlantic provinces of Newfoundland and Labrador, Nova Scotia, Prince Edward Island, and New Brunswick; B) the Central region which includes Quebec and Ontario; C) the Western provinces - British Columbia, Alberta, Saskatchewan, Manitoba, and D) the North.

All provinces relied heavily on Ontario for their imports, including industrial inputs. Of the total GDP arising from international exports, both directly and indirectly, the lion's share (42%) was earned in Ontario in 1996, up from 41% in 1990.[4] Quebec, a distant second, earned 19% of GDP arising from international exports in 1996 (18% in 1990).

A. Atlantic Canada

Only a relatively small portion of inter-provincial exports from the four Atlantic provinces was destined for the four Western provinces. Of total provincial exports, 11% from Newfoundland and Labrador, 9% from Prince Edward Island, 16% from Nova Scotia, and 8% from New Brunswick were shipped westward in 1996.

All four provinces exported their products to markets within the Atlantic region with Prince Edward Island and Nova Scotia shipping significant proportions to New Brunswick. Food and tobacco products, various manufactured goods, and petroleum products were the top three inter-provincial imports for each of the Atlantic provinces.[5]

About a quarter of Newfoundland and Labrador's exports stayed within the Atlantic region in 1996, up slightly from 1990 when the share was 21%. The largest share of the province's exports went to Quebec (Figure 3), but this share declined by about 6 percentage points over the period. Exports of services declined from 55% of exports in 1990 to 52% in 1996, but transportation and related services remained the province's leading export, followed by mining and food products.

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[4] Appendix D gives the Input/Output model used to generate GDP from exports.

[5] Statistics Canada's policies on confidentiality preclude a detailed analysis by commodity in inter-provincial trade, and prevent an intensive study of the high technology sector.

About half of Newfoundland and Labrador's inter-provincial imports came from Ontario, about $2 billion in 1996 (Figure 7). Another 26% were imported from Quebec. Imports from Nova Scotia declined somewhat, but imports from New Brunswick increased marginally. About 44% of imports were services in 1996, a decrease of 5 percentage points from 1990.

The largest share of Prince Edward Island's inter-provincial exports – 49% – was sold within the Atlantic region (Figure 4). Of those, the largest share went to New Brunswick. Sales to the Western provinces increased somewhat, while shipments to Ontario and Quebec decreased. Services made up about 44% of exports in 1996, down 8 percentage points from 1990. Potatoes and other food and agricultural products dominated PEI's export portfolio.

The largest, but declining, proportion of Prince Edward Island's inter-provincial imports came from Ontario – about 39% in 1996 (totaling about half a billion dollars) (Figure 8). Imports from Quebec remained constant at about 19% of total imports, but New Brunswick edged out Quebec as the secondary source. The proportion coming from New Brunswick increased by 4 percentage points to 19% of total imports in 1996. Services accounted for 37% of imports.

Nova Scotia's sales within the Atlantic region declined somewhat, from 42% of the total in 1990 to 38% in 1996 (Figure 5). Exports to Quebec increased by about 4 percentage points, while sales to Ontario declined slightly. Services made up about 40% of Nova Scotia's inter-provincial exports, followed by motor vehicles and parts, and food products.

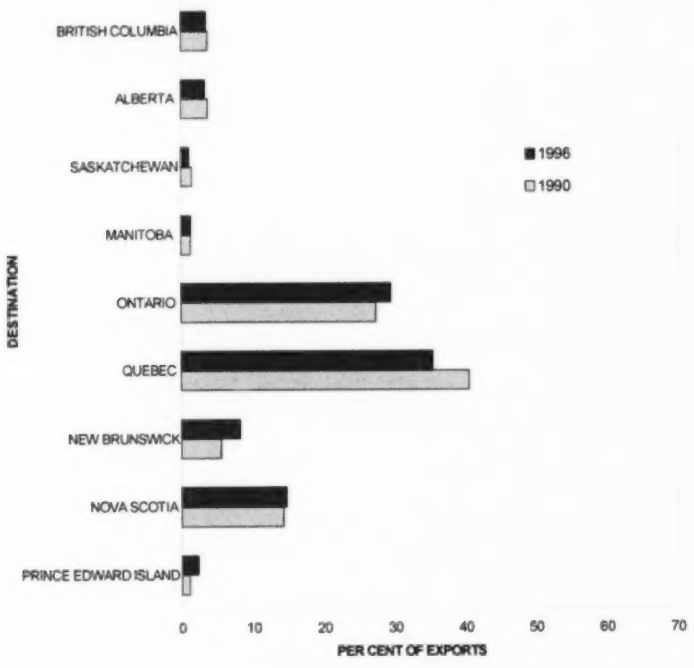
Nova Scotians imported a significantly larger portion of their total imports from Ontario than they did from Quebec (Figure 9). Imports from Ontario were more than half of total inter-provincial imports, and those from Quebec were about 24% of total imports in 1990, falling to 22% in 1996. Services accounted for 41% of imports in 1996, up from 39% in 1990.

New Brunswick sold a smaller proportion of its products in the Atlantic region in 1996 than in 1990 (Figure 6), down 7 percentage points to about 31% in 1996. The share of exports going to Nova Scotia decreased, while shipments to Quebec and Ontario increased. In 1996, exports of services were 28% of the total, down from 35% in 1990. Lumber and wood products, petroleum products, and food products were next in importance.

The sources of New Brunswick's inter-provincial imports remained quite constant between 1990 and 1996 (Figure 10). Forty-six per cent of imports were services in 1996, 43% in 1990. About 7% of New Brunswick's imports came from Western Canada, and another 13% of purchases were from Nova Scotia, mainly food and petroleum products. The rest were from Ontario (43%) and Quebec (33%).

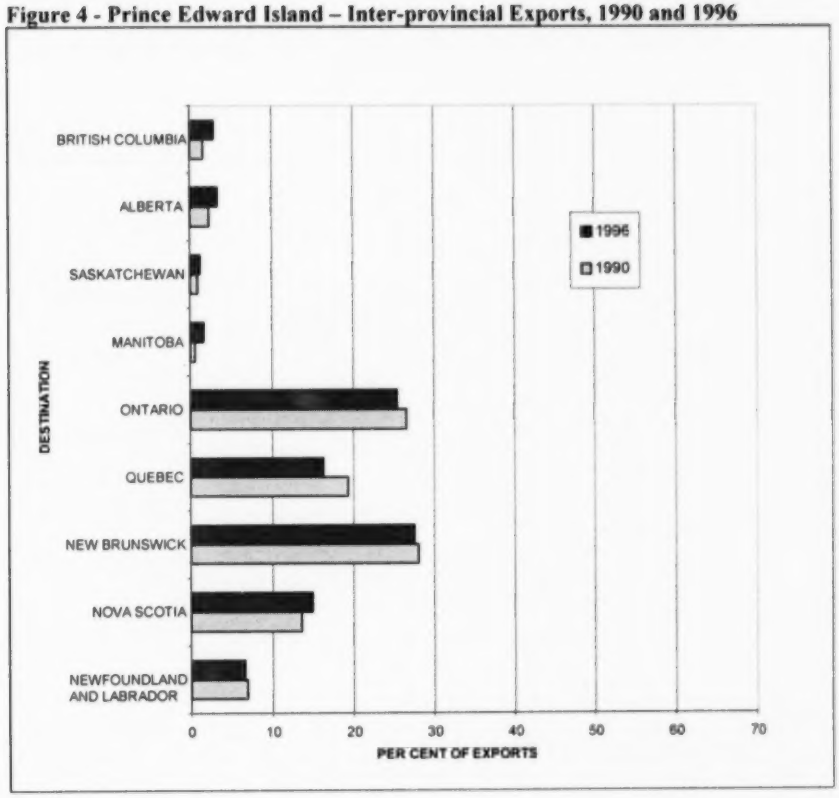
Exports

Figure 3 – Newfoundland and Labrador – Inter-provincial Exports, 1990 and 1996



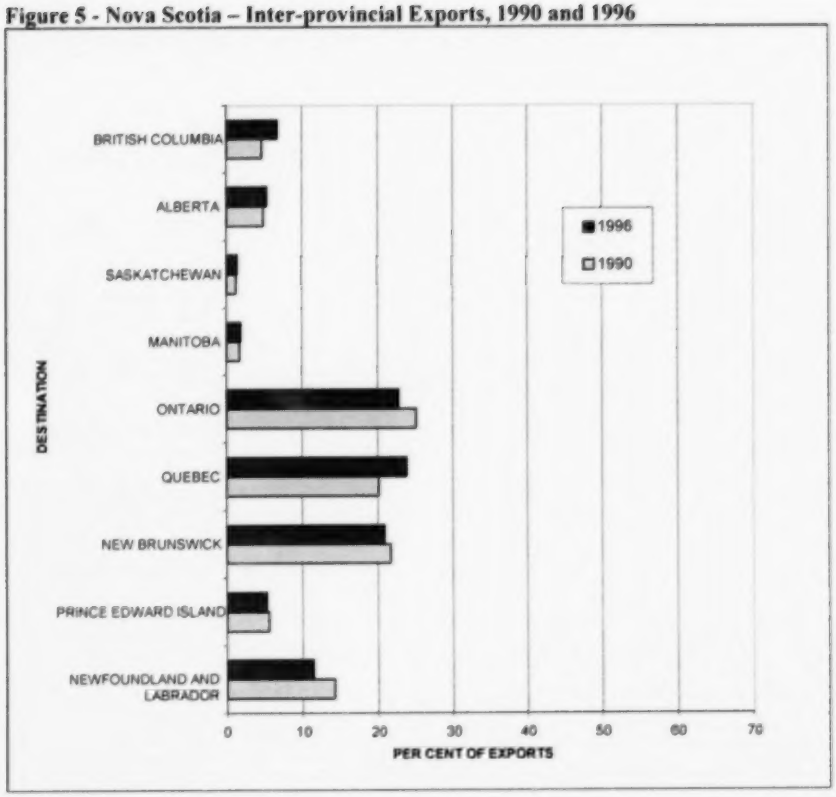
Source: Statistics Canada, calculations based on Input-Output Division data, 1990 and 1996.

Figure 4 - Prince Edward Island – Inter-provincial Exports, 1990 and 1996



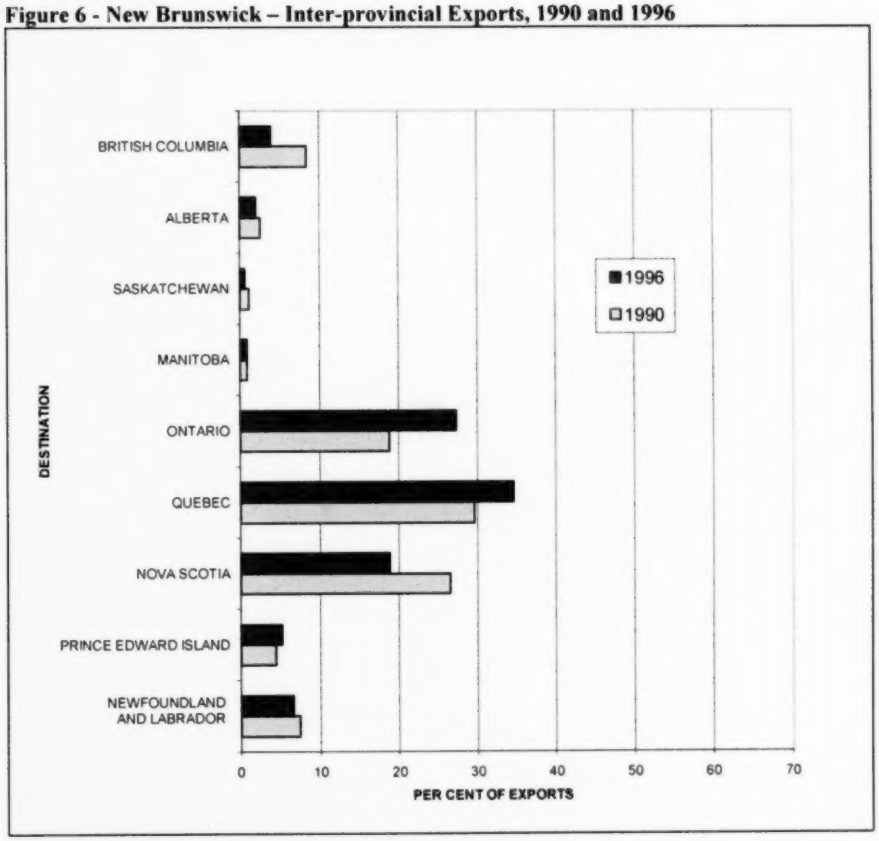
Source: Statistics Canada, calculations based on Input-Output Division data, 1990 and 1996.

Figure 5 - Nova Scotia – Inter-provincial Exports, 1990 and 1996



Source: Statistics Canada, calculations based on Input-Output Division data, 1990 and 1996.

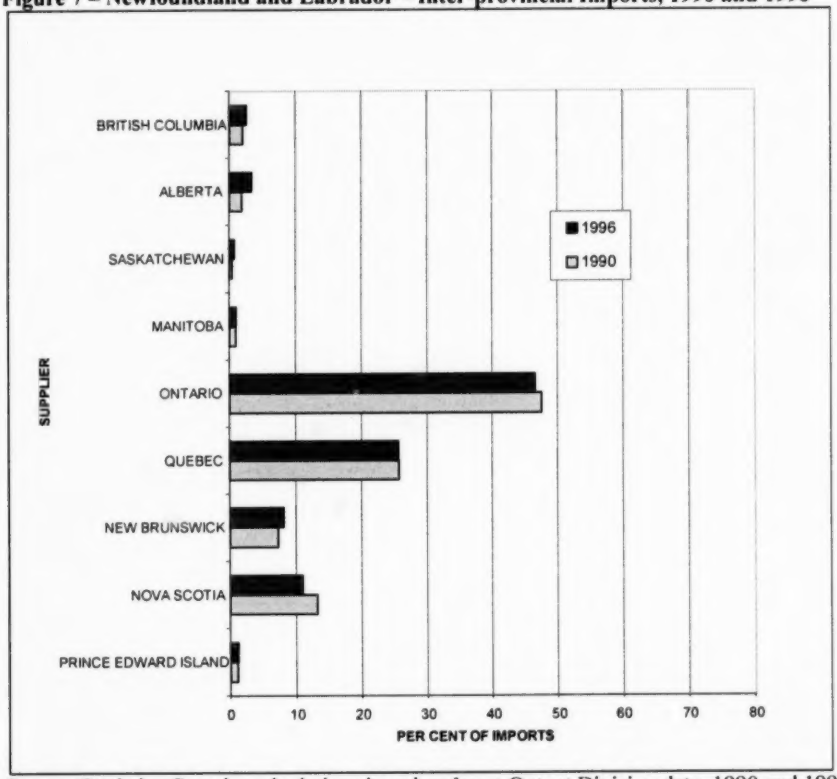
Figure 6 - New Brunswick – Inter-provincial Exports, 1990 and 1996



Source: Statistics Canada, calculations based on Input-Output Division data, 1990 and 1996.

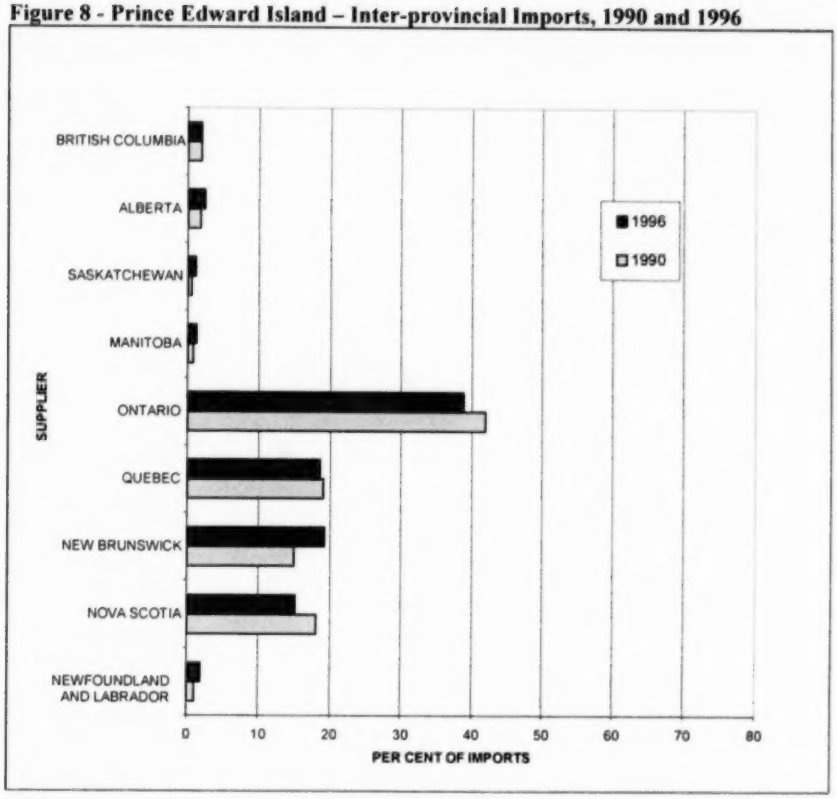
Imports

Figure 7 – Newfoundland and Labrador – Inter-provincial Imports, 1990 and 1996



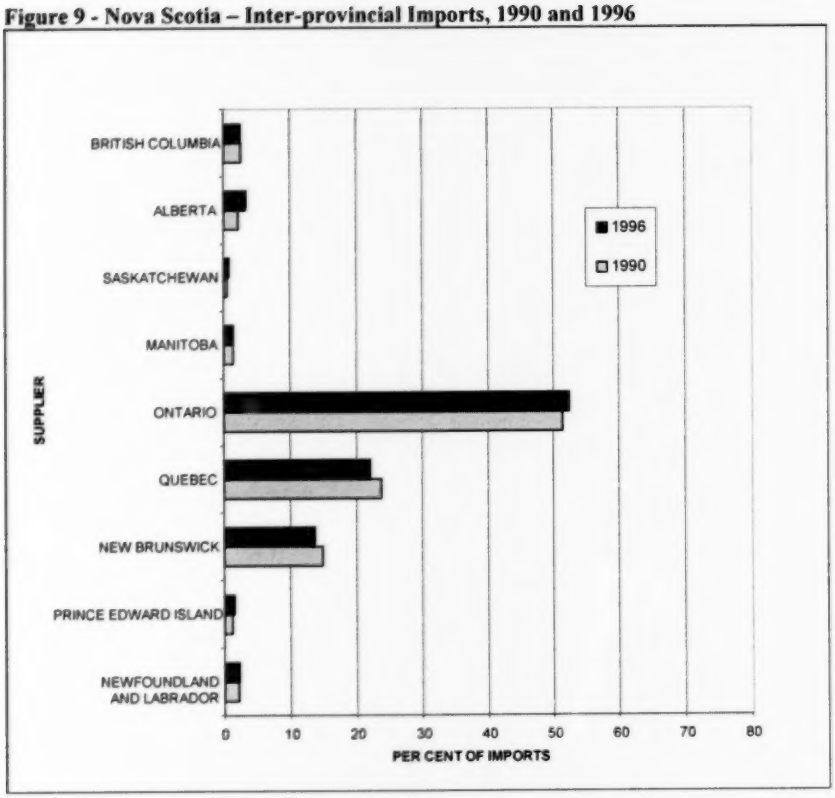
Source: Statistics Canada, calculations based on Input-Output Division data, 1990 and 1996.

Figure 8 - Prince Edward Island – Inter-provincial Imports, 1990 and 1996



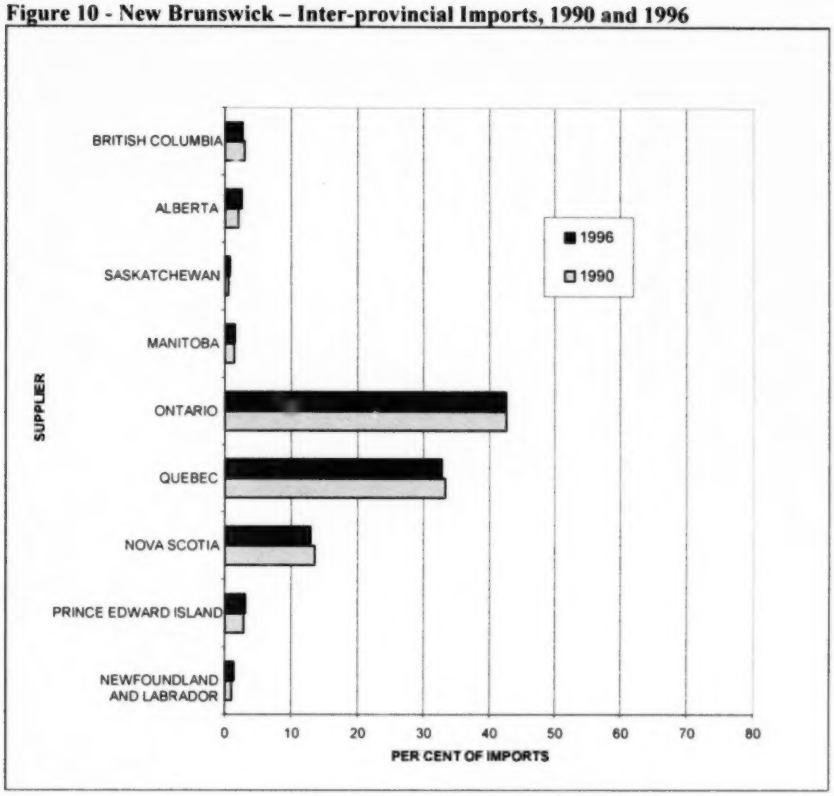
Source: Statistics Canada, calculations based on Input-Output Division data, 1990 and 1996.

Figure 9 - Nova Scotia – Inter-provincial Imports, 1990 and 1996



Source: Statistics Canada, calculations based on Input-Output Division data, 1990 and 1996.

Figure 10 - New Brunswick – Inter-provincial Imports, 1990 and 1996



Source: Statistics Canada, calculations based on Input-Output Division data, 1990 and 1996.

B. Central Canada

The most striking aspect of trade within Central Canada is the extent to which Quebec and Ontario traded with each other. Ontario's shipments to Quebec in 1996 were about $27 billion, and Quebec's to Ontario $20 billion. Almost 61% of Quebec's inter-provincial exports went to Ontario in 1990, 58% in 1996 (Figure 11), and about 40% of Ontario's exports were sent to Quebec markets (Figure 12).

In 1996 about three-quarters of Quebec's inter-provincial imports came from Ontario (Figure 13), and 49% of Ontario's imports came from Quebec (54% in 1990) (Figure 14). Quebec's purchases from Ontario were valued at $23 billion in 1990, $27 billion in 1996.

About 33% of Quebec's internal exports were in services during both 1990 and 1996. Manufactured goods (including metal products), food and tobacco, and lumber and wood products were leading exports in goods.

Quebec's leading imports were manufactured goods, food and tobacco products, motor vehicles and parts from Ontario, as well as mining products from Alberta. In 1996, services comprised 39% of total imports, down from 43% in 1990.

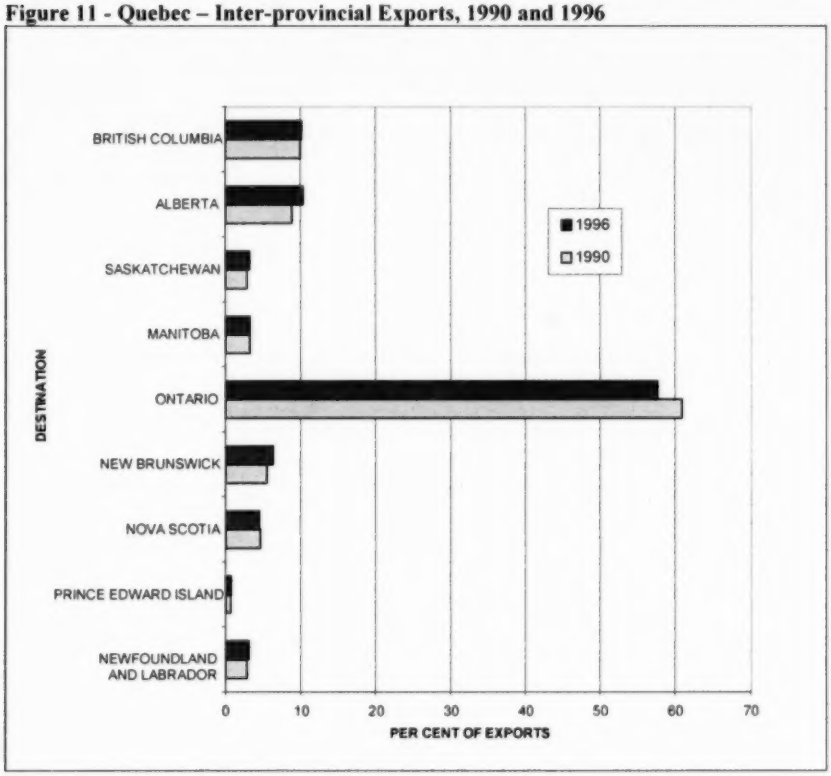
Ontario appears to have three trading blocks other than Quebec. In 1996 about 14% of its sales were to the four Atlantic provinces, another 12% to Manitoba and Saskatchewan, and 33% to Alberta and British Columbia combined. The province's leading inter-provincial exports in both years were services, which

made up about 44% of total exports, followed by "other manufactured goods," and food and tobacco products.

Ontario's imports from Quebec equaled $20 billion in both 1990 and 1996 – about half of Ontario's inter-provincial imports. However, a significant portion, a growing portion, came from Western Canada. In 1990 imports from the West were 40% of the total, and in 1996 about 44%, half of which came from Alberta. Services were a relatively smaller portion of Ontario's imports – 33% in 1996, 34% in 1990. Imports included manufactured goods, food and tobacco products, lumber and wood products, and mining and petroleum products.

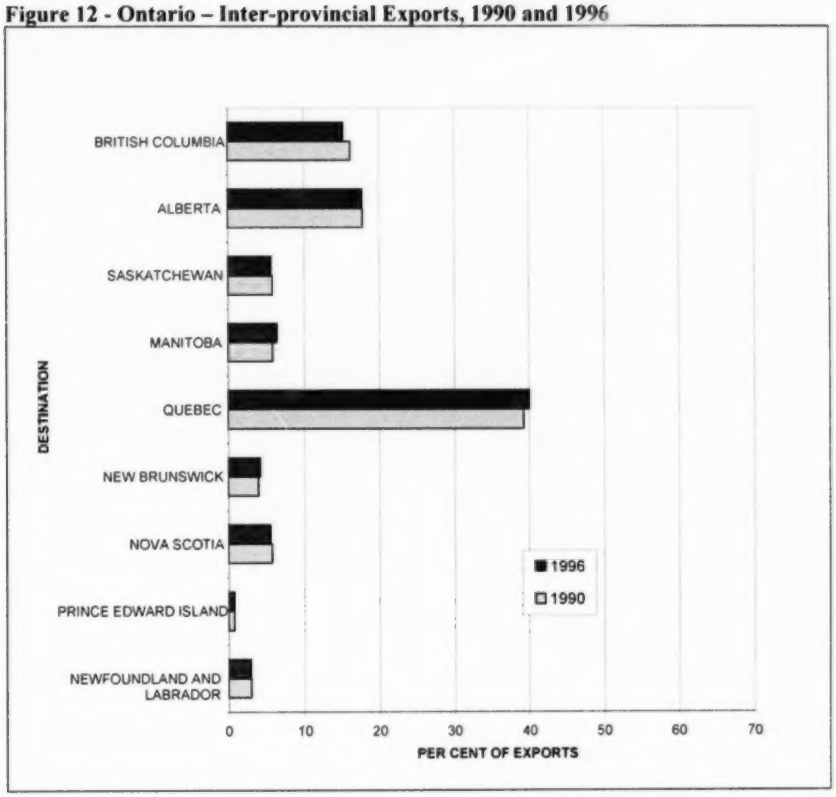
Exports

Figure 11 - Quebec – Inter-provincial Exports, 1990 and 1996



Source: Statistics Canada, calculations based on Input-Output Division data, 1990 and 1996.

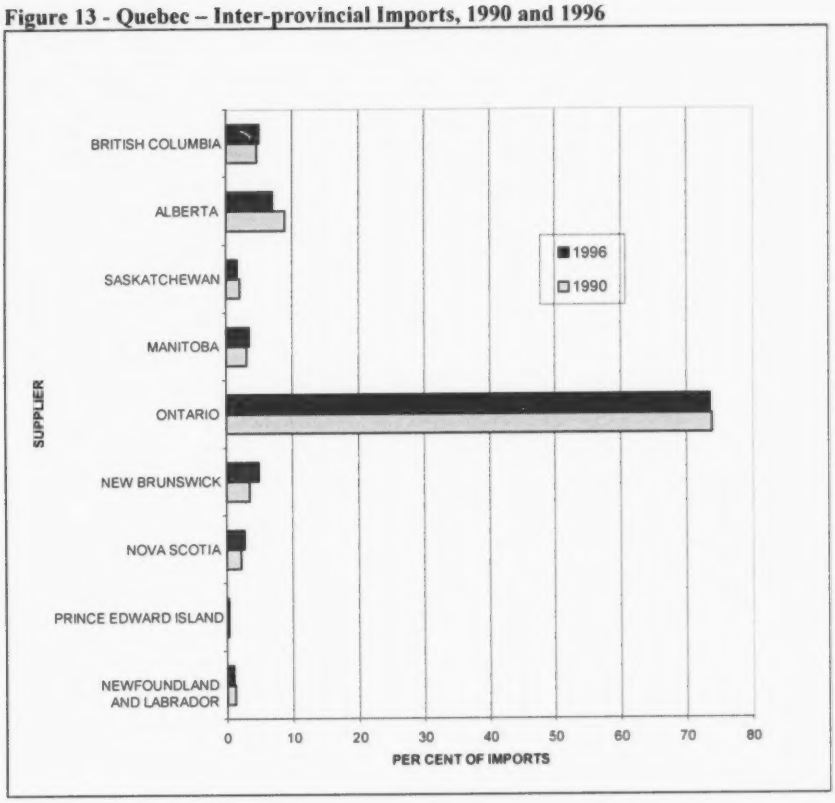
Figure 12 - Ontario – Inter-provincial Exports, 1990 and 1996



Source: Statistics Canada, calculations based on Input-Output Division data, 1990 and 1996.

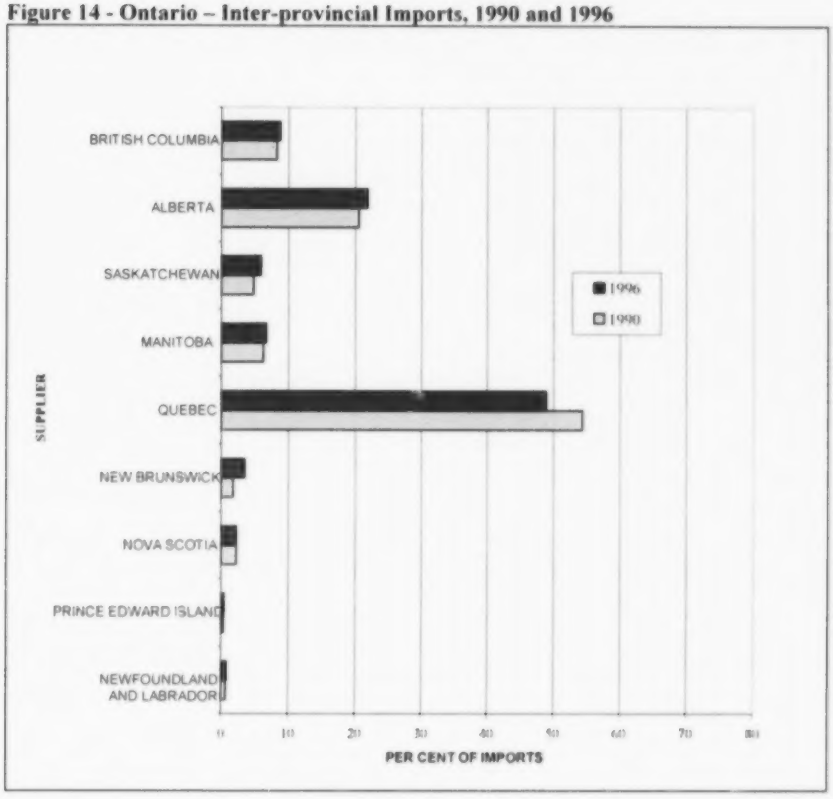
Imports

Figure 13 - Quebec – Inter-provincial Imports, 1990 and 1996



Source: Statistics Canada, calculations based on Input-Output Division data, 1990 and 1996.

Figure 14 - Ontario – Inter-provincial Imports, 1990 and 1996



Source: Statistics Canada, calculations based on Input-Output Division data, 1990 and 1996.

C. Western Canada

A relatively small proportion of the exports from the four Western provinces was exported to the Atlantic region between 1990 and 1996. Only 3% of Manitoba's inter-provincial exports, 2% of Saskatchewan's, 2% of Alberta's and 4% of British Columbia's exports were sold in Eastern Canada in 1990 and 1996. The share of exports destined for Ontario fell for each of the four provinces.

The four Western provinces relied heavily on Ontario and to a lesser degree on Quebec for their inter-provincial imports, and a small portion of their needs were supplied by the Atlantic region. With the exception of Manitoba, they reduced the share coming from Ontario between 1990 and 1996.

Manitoba's inter-provincial exports were about evenly divided between Central Canada and the other three Western provinces (Figure 15). The highest proportion that went to any one province was to Ontario (37% in 1996). Almost 45% of Manitoba's exports went westward in 1990, 48% in 1996. About 20% of exports were destined for Alberta. Almost 33% of Manitoba's exports were services. Food and other agricultural products, machinery and equipment, and miscellaneous manufactured goods dominated sales of goods.

Manitobans purchased about 47% of their inter-provincial imports from suppliers in Ontario during both 1990 and 1996, and most of the remainder from neighbours to the west (Figure 19). Almost 22% of imports originated in Alberta in 1996, up 3 percentage points from 1990. Services imports increased from

40% of the total in 1990 to 42% in 1996. Petroleum products, food and tobacco products, and manufactured goods topped the list of goods imported.

About half (52%) of Saskatchewan's exports went to destinations within the Western region, with 29% of exports going to Alberta in 1996 (Figure 16). A smaller share was sold in Quebec and Ontario. Mining products and agricultural products were leading exports in goods (in that order), followed by manufactured goods. Services were 28% of total exports in 1996, down from 33% in 1990.

The primary source of Saskatchewan's inter-provincial imports was Ontario from whom it imported 42% of total imports in 1996, up from 37% in 1990 (Figure 20). Almost 25% originated in Alberta in 1990, 30% in 1996. The remainder was about equally divided between British Columbia, Manitoba, and Quebec. Imports of services were 40% of the total in 1990, rising to 42% in 1996. Petroleum products, chemical products, and manufactured goods were first on the shopping list of goods.

Albertans shipped about an equal share of exports between Central and Western destinations in 1990 and 1996 (Figure 17). However, the proportion going to Alberta's neighbouring provinces increased, while the proportion sent to Quebec and Ontario declined. Services made up a relatively small proportion of inter-provincial exports – 29% in 1996, 31% in 1990. Exports of mining products and processed petroleum and coal products made up about 38% of inter-provincial exports in 1996, down from 42% in 1990. Food products were also an important export.

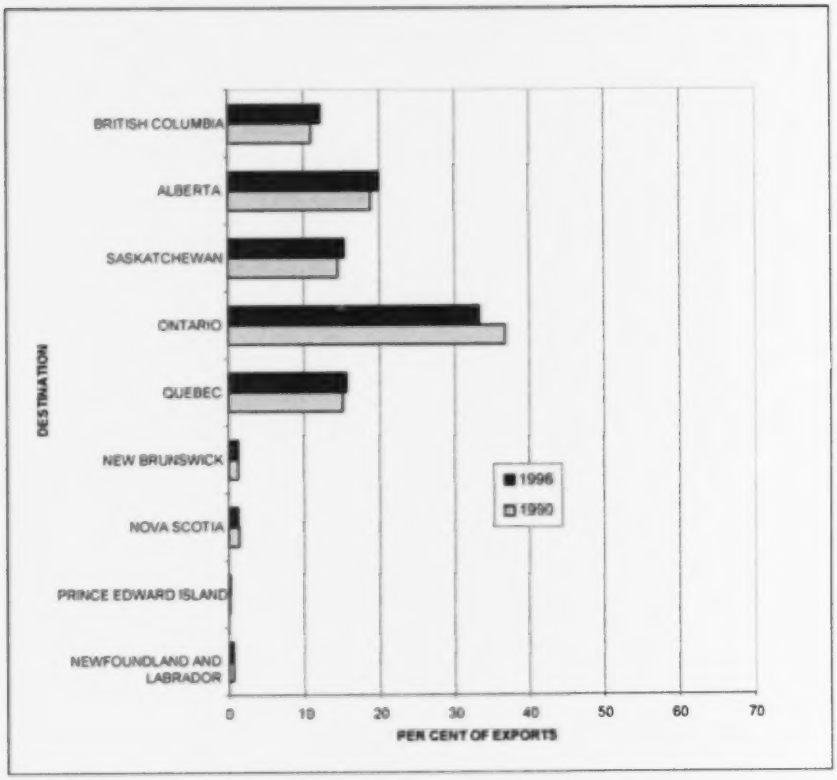
Alberta's primary imports were miscellaneous manufactured goods, food and tobacco products, and motor vehicles and parts. Of the $20 billion in purchases from the rest of Canada, 41% were services in 1996, down from 46% in 1990 (Figure 21). Ontario was the main supplier as half the imports originated there in 1990 and 46% in 1996. Another 21% came from British Columbia, and 14% from Quebec.

About 55% of British Columbia's inter-provincial exports were to destinations within Western Canada, with Alberta absorbing 40% of the B.C.'s exports (Figure 18). About 28% were shipped to Ontario. Services, especially transportation and related services, were predominant, making up 58% of exports in 1996, down by 3 percentage points from 1990. Lumber and wood products, food, and manufactured goods were leading exports of goods.

British Columbia purchased less from Central Canada, and more from the three prairie provinces in 1996 than it did in 1990 (Figure 22). Ontario remained the largest source supplying 46% of B.C.'s needs in 1996, down 4 percentage points from 1990. Imports from Alberta increased by 4 percentage points. Services made up the largest proportion - about 40% – followed by food and tobacco products, manufactured goods, and petroleum products

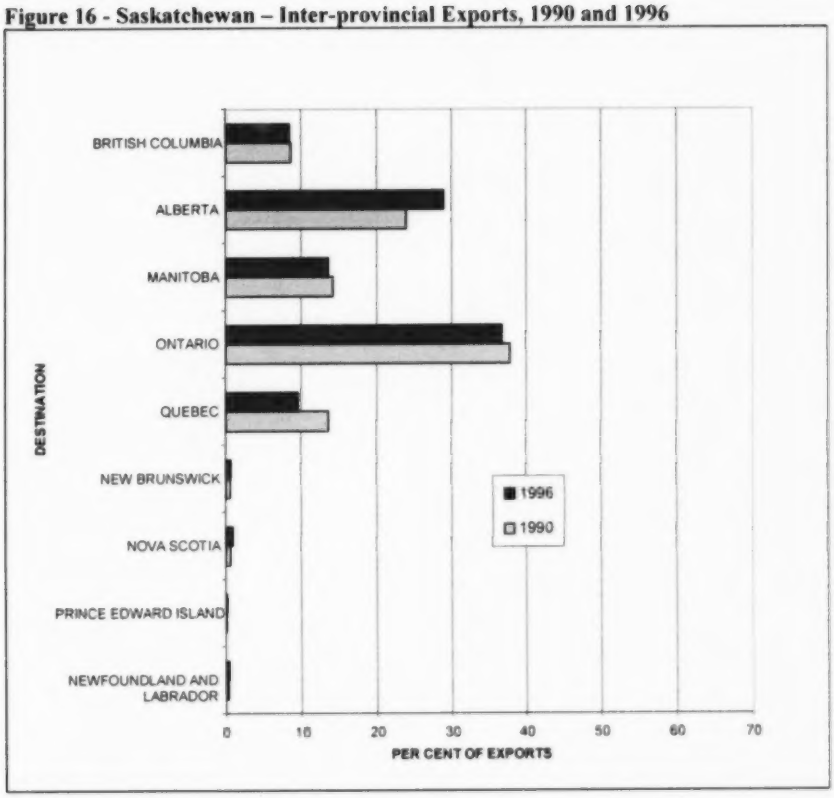
Exports

Figure 15 - Manitoba – Inter-provincial Exports, 1990 and 1996



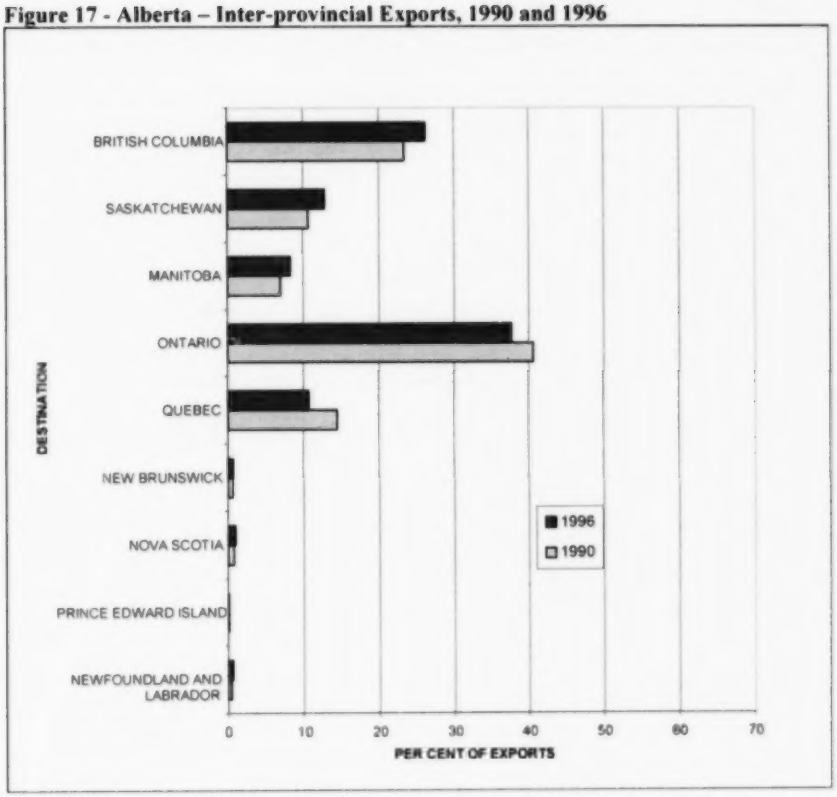
Source: Statistics Canada, calculations based on Input-Output Division data, 1990 and 1996.

Figure 16 - Saskatchewan – Inter-provincial Exports, 1990 and 1996



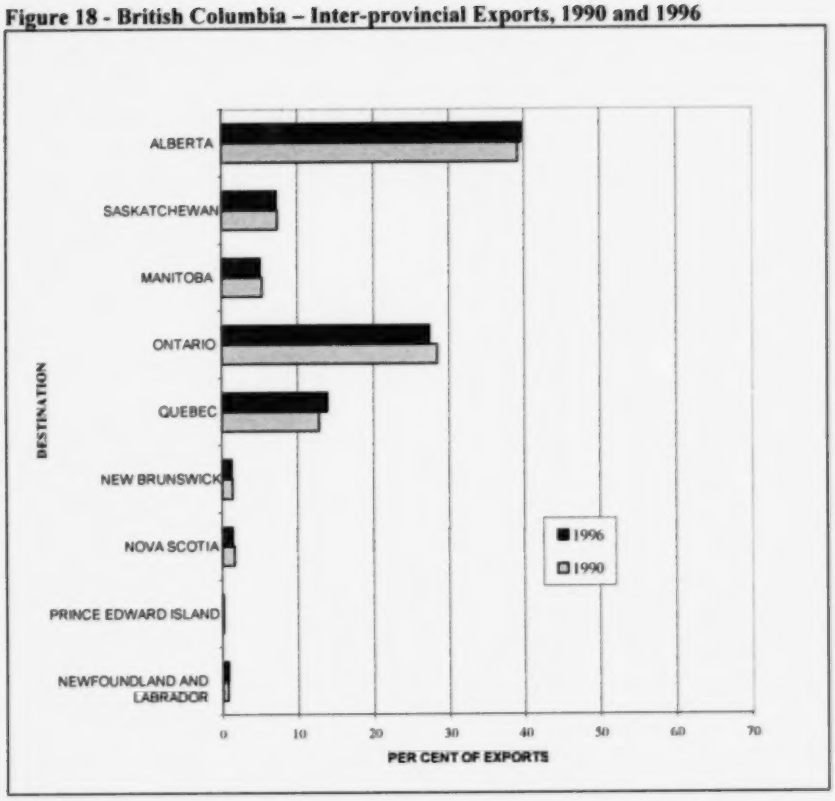
Source: Statistics Canada, calculations based on Input-Output Division data, 1990 and 1996.

Figure 17 - Alberta – Inter-provincial Exports, 1990 and 1996



Source: Statistics Canada, calculations based on Input-Output Division data, 1990 and 1996.

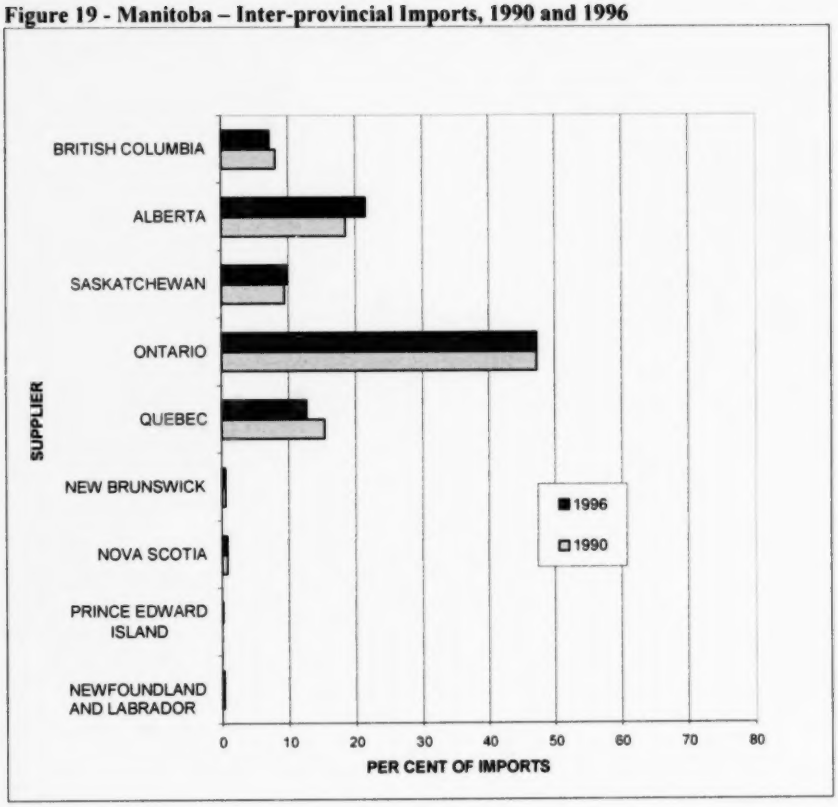
Figure 18 - British Columbia – Inter-provincial Exports, 1990 and 1996



Source: Statistics Canada, calculations based on Input-Output Division data, 1990 and 1996.

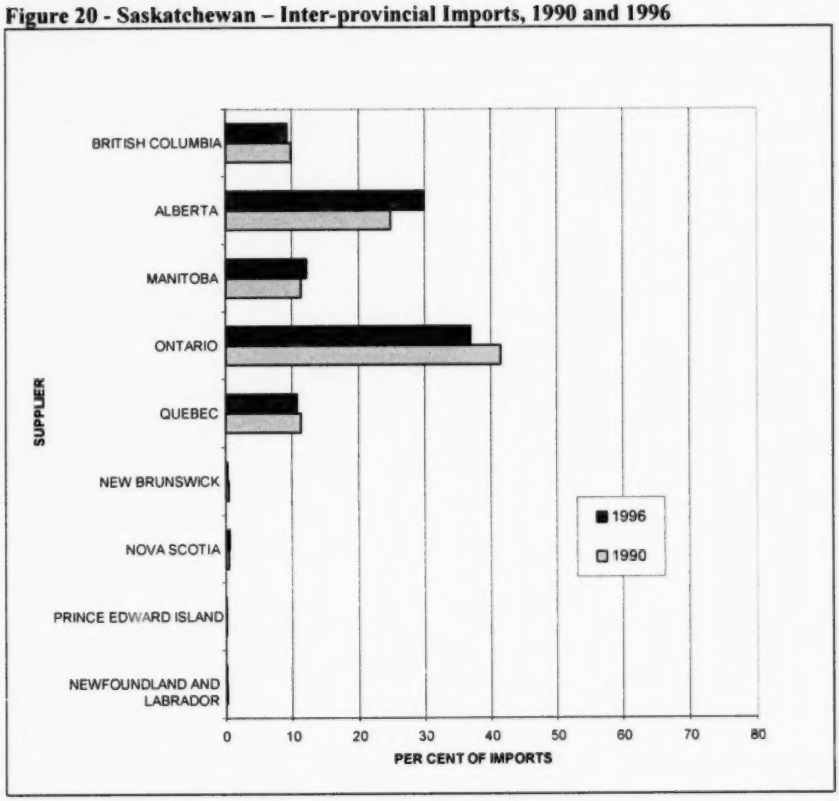
Imports

Figure 19 - Manitoba – Inter-provincial Imports, 1990 and 1996



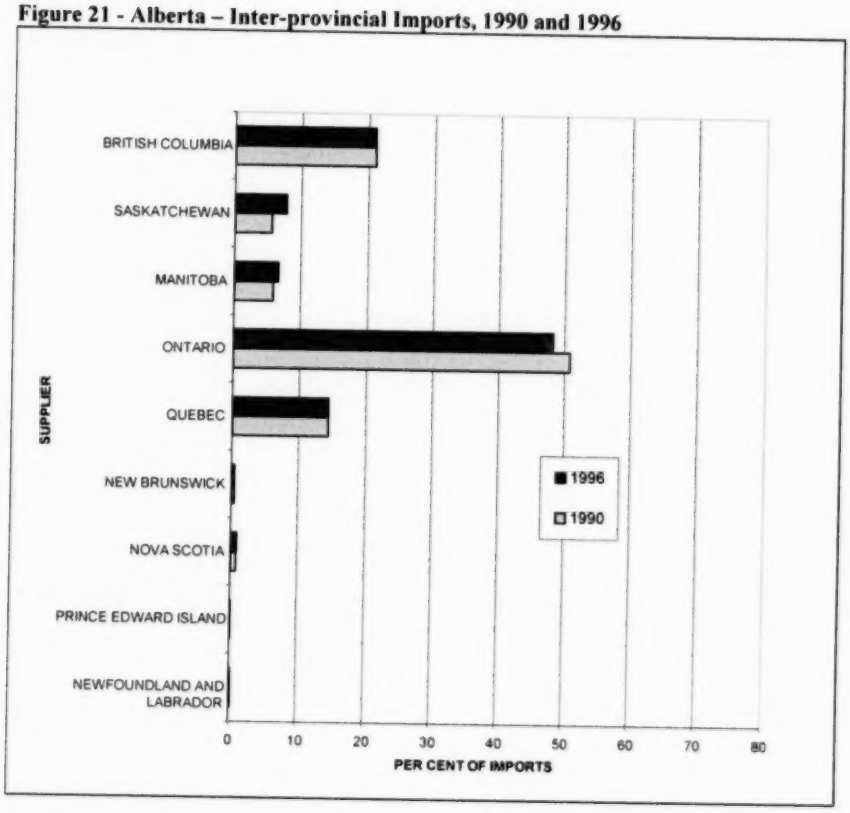
Source: Statistics Canada, calculations based on Input-Output Division data, 1990 and 1996.

Figure 20 - Saskatchewan – Inter-provincial Imports, 1990 and 1996



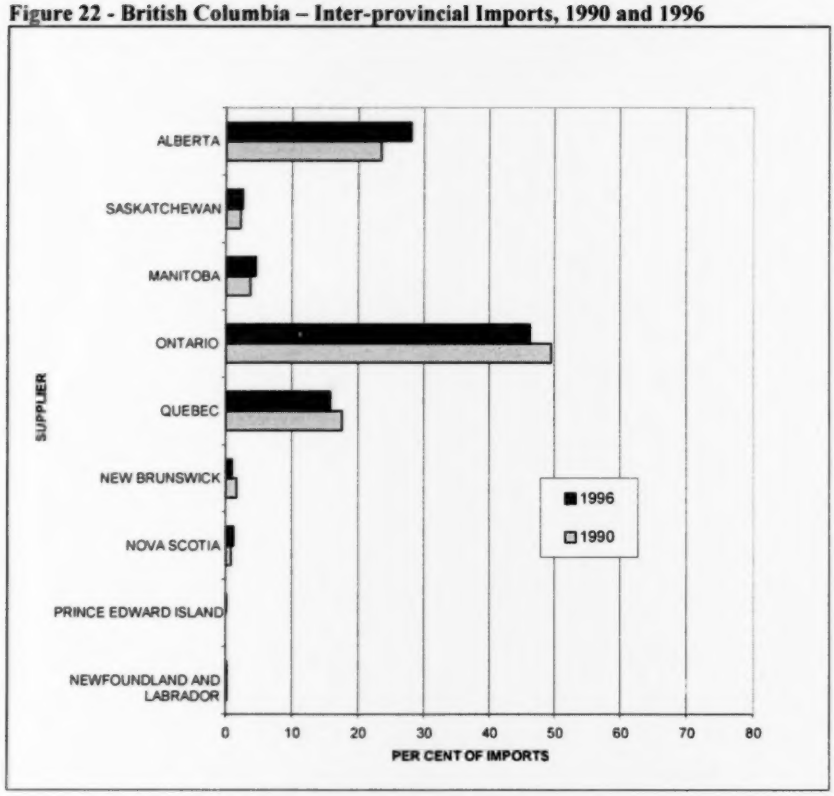
Source: Statistics Canada, calculations based on Input-Output Division data, 1990 and 1996.

Figure 21 - Alberta – Inter-provincial Imports, 1990 and 1996



Source: Statistics Canada, calculations based on Input-Output Division data, 1990 and 1996.

Figure 22 - British Columbia – Inter-provincial Imports, 1990 and 1996



Source: Statistics Canada, calculations based on Input-Output Division data, 1990 and 1996.

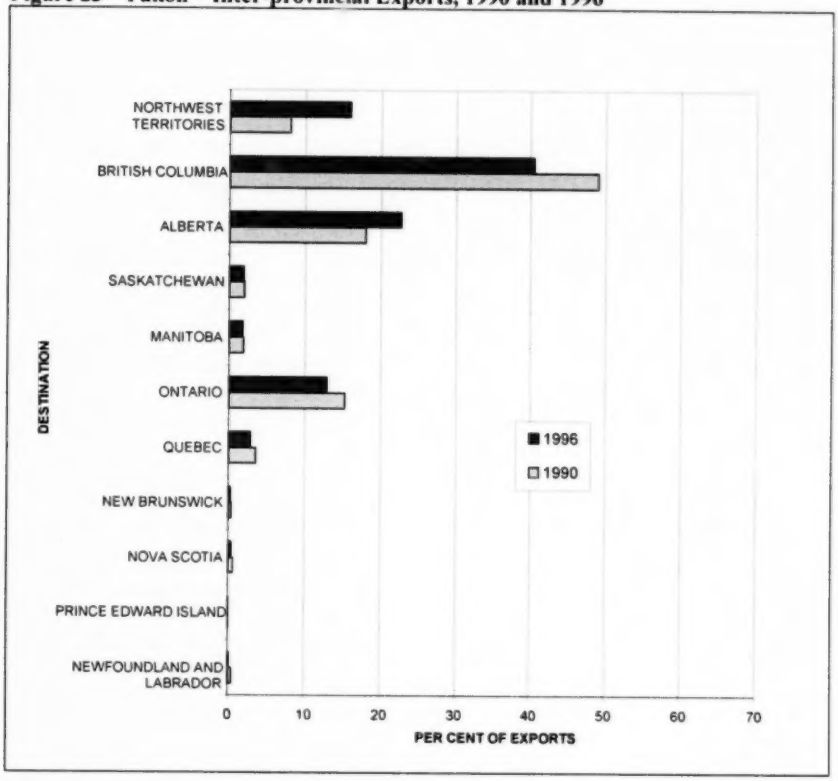
D. The North

The Yukon's main markets were British Columbia and Alberta (Figure 23). However, in 1996 a reduced share of its internal exports was shipped to British Columbia in favour of markets in Alberta and the Northwest Territories. The Yukon's main exports were in services – about 79% in 1996. Mining products were secondary. More than half of the Yukon's imports was services – 55% in 1990, 53% in 1996. There was a significant reduction in the share imported from British Columbia (Figure 25). About 45% originated in BC in 1990, falling to 36% in 1996. The greater share came from Ontario, followed by Quebec and Alberta. Food and tobacco products, manufactured goods, and petroleum products were the leading imports.

The share of exports from the Northwest Territories to Ontario increased significantly between 1990 and 1996, while the proportions sent to British Columbia and Alberta fell (Figure 24). Mining products were the predominant export, but shipments declined during the period. Services made up 46% of exports in 1996, up from 39% in 1990. Services were a declining portion of imports, falling from 59% in 1990 to 52% in 1996. Manufactured products, petroleum products, and food and tobacco were imported from Ontario (33% of the total in 1996), Alberta, Quebec, and British Columbia (Figure 26).

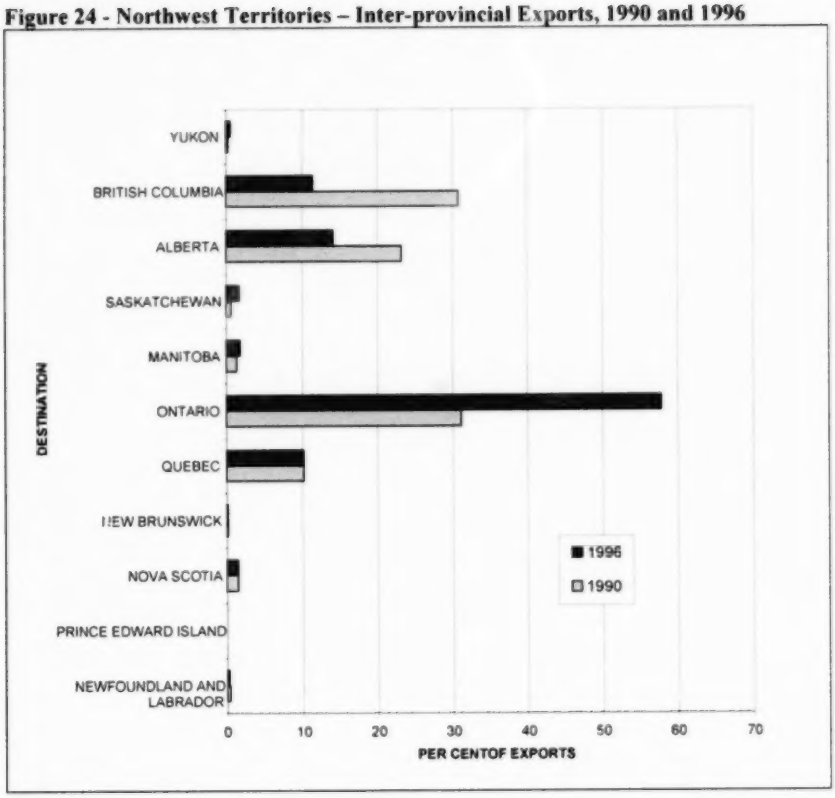
Exports

Figure 23 - Yukon – Inter-provincial Exports, 1990 and 1996



Source: Statistics Canada, calculations based on Input-Output Division data, 1990 and 1996.

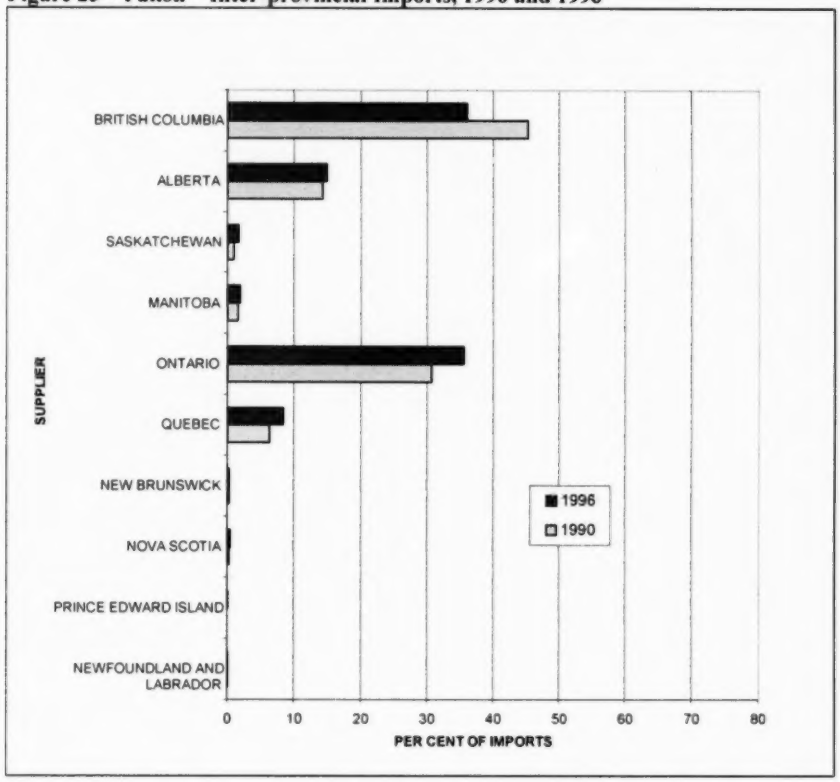
Figure 24 - Northwest Territories – Inter-provincial Exports, 1990 and 1996



Source: Statistics Canada, calculations based on Input-Output Division data, 1990 and 1996.

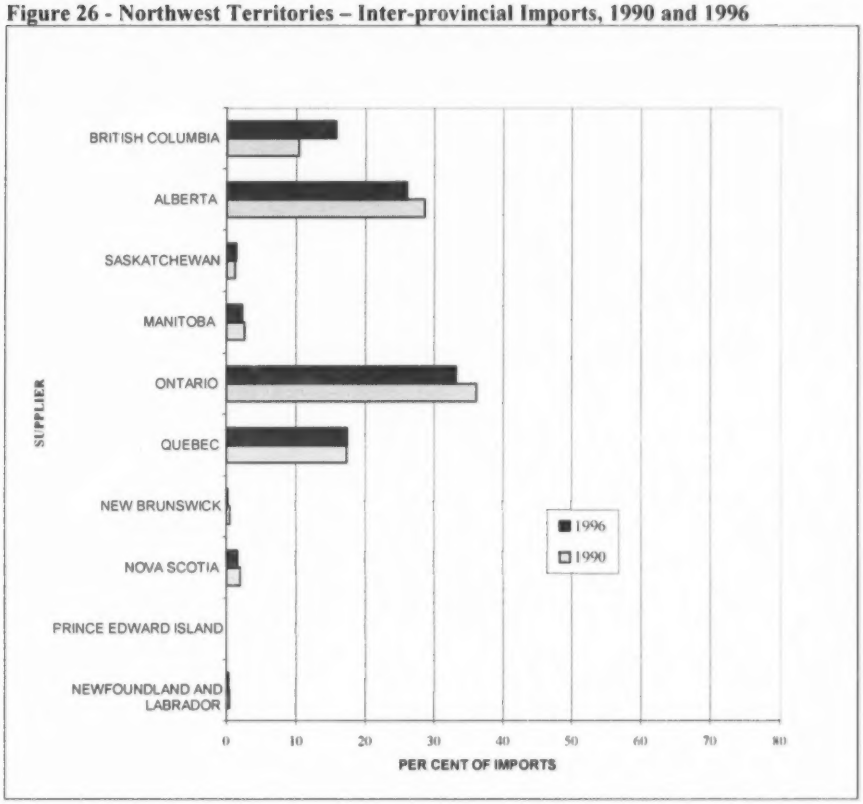
Imports

Figure 25 - Yukon – Inter-provincial Imports, 1990 and 1996



Source: Statistics Canada, calculations based on Input-Output Division data, 1990 and 1996.

Figure 26 - Northwest Territories – Inter-provincial Imports, 1990 and 1996



Source: Statistics Canada, calculations based on Input-Output Division data, 1990 and 1996.

Conclusions

The slow growth in inter-provincial trade relative to international trade between 1990 and 1996 cannot be attributed to one specific factor. The FTA (1989) may have opened up new opportunities in the United States, resulting in a shift in focus to expanding international sales in the face of a sluggish domestic economy. Some changes did, however, occur. In 1990 Prince Edward Island, Nova Scotia, New Brunswick, Quebec, Manitoba, and Alberta exported more to their provincial counterparts than to international destinations. By 1996, however, all the provinces except Prince Edward Island, Nova Scotia and Manitoba exported more internationally than they did inter-provincially.

Both international and inter-provincial imports increased between 1990 and 1996. In 1990, the volume of international imports exceeded that of inter-provincial imports for all provinces except Quebec and Ontario. In 1996, Quebec, Ontario, and also British Columbia imported more from external sources than internal ones.

The trade patterns in inter-provincial trade showed modest changes between 1990 and 1996 as the effects of the Agreement on Internal Trade (1995) were yet to be seen. The volume of trade between the Atlantic

provinces and the four western provinces was quite small due to high transportation costs and similarity of products, and changed only marginally during the period. Nova Scotia and Prince Edward Island, however, shipped a larger share of their total exports to western points. Changes in export destinations varied by province, but Ontario, Quebec, and New Brunswick were the main markets. For their imports, the Atlantic provinces relied most heavily on Ontario, and secondly Quebec with little change between 1990 and 1996.

The close interdependence of Quebec and Ontario is apparent. However, Quebec reduced the share of its exports destined for Ontario, while Ontario increased the proportion of its exports shipped to Quebec. Ontario also imported a substantial and increasing proportion of its total imports from Alberta and British Columbia.

The volume of trade among the four western provinces increased somewhat, and overall their reliance on Ontario as a destination for their exports declined. Saskatchewan and Alberta exported a smaller proportion of their total exports to Quebec, while a larger share of British Columbia's and Manitoba's exports were destined for Quebec. The destination of exports from the Northwest Territories shifted to Ontario at the expense of Alberta and British Columbia.

Appendix A - Growth in total exports and GDP, 1990 to 1996

Province or Territory	Growth in Exports (%)	Average Annual Growth Rate in Exports (%)	Growth In GDP (%)	Average Annual Growth Rate in GDP (%)
CANADA	89.1	11.2	22.0	3.4
Newfoundland and Labrador	16.5	2.6	12.6	2.0
Prince Edward Island	91.8	11.5	27.2	4.1
Nova Scotia	51.1	7.1	11.8	1.9
New Brunswick	54.7	7.5	21.7	3.3
Quebec	90.8	11.4	14.3	2.3
Ontario	97.9	12.0	20.6	3.2
Manitoba	69.6	9.2	16.0	2.5
Saskatchewan	104.0	12.6	28.8	4.3
Alberta	105.1	12.7	33.9	5.0
British Columbia	65.5	8.8	34.2	5.0
Yukon	-34.2	-6.7	-0.8	-0.1
Northwest Territories	10.2	1.6	17.0	2.6

Source: Statistics Canada, calculations based on Input-Output Division data, 1990 and 1996.

Appendix B – Sources of GDP
(current dollars, '000)

Province or Territory	GDP from all Sources 1990	GDP from Exports 1990	GDP from Non-exports 1990	GDP from all Sources 1996	GDP from Exports 1996	GDP from Non-exports 1996
CANADA	592,805,195	111,715,646	481,089,549	723,147,904	196,294,175	526,853,729
Newfoundland and Labrador	7,846,808	1,504,017	6,342,791	8,836,303	1,909,023	6,927,280
Prince Edward Island	1,915,840	220,624	1,695,216	2,437,591	391,415	2,046,176
Nova Scotia	14,872,056	1,964,692	12,907,364	16,620,523	2,750,466	13,870,057
New Brunswick	11,695,235	2,570,540	9,124,695	14,229,775	3,344,234	10,885,541
Quebec	134,338,101	20,183,267	114,154,834	153,588,961	37,407,052	116,181,909
Ontario	240,999,753	46,150,062	194,849,691	290,763,480	83,045,007	207,718,473
Manitoba	20,888,494	3,277,240	17,611,254	24,240,984	5,122,512	19,118,472
Saskatchewan	19,477,631	4,840,173	14,637,458	25,080,771	8,818,447	16,262,324
Alberta	66,969,236	14,355,478	52,613,758	89,664,146	28,436,083	61,228,063
British Columbia	70,037,447	15,725,243	54,312,204	93,977,437	24,336,103	69,641,334
Yukon	1,054,808	497,131	557,677	1,046,810	284,570	762,240
Northwest Territories	2,047,029	427,180	1,619,849	2,394,709	436,446	1,958,263

Note Columns do not sum to total Canadian GDP because the "government abroad" region was not included

Source: Statistics Canada, calculations based on Input-Output Division data, 1990 and 1996.

Appendix C – Provincial GDP generated by exports as a percent of national GDP arising from exports

Province or Territory	1990	1996
	(%)	(%)
Ontario	41.3	42.3
Quebec	18.1	19.1
Alberta	12.9	14.5
British Columbia	14.1	12.4
Saskatchewan	4.3	4.5
Manitoba	2.9	2.6
New Brunswick	2.3	1.7
Nova Scotia	1.8	1.4
Newfoundland and Labrador	1.3	1.0
Prince Edward Island	0.2	0.2
Northwest Territories	0.4	0.2
Yukon	0.4	0.1

Source: Statistics Canada, calculations based on Input-Output Division data, 1990 and 1996.

Appendix D – the Input-Output algebraic model

GDP is calculated in three different but equivalent ways.

1. Expenditures–sum of consumption spending, fixed investment, government purchases, changes in inventories, and net exports (exports minus imports)
2. Incomes–sum of wages and salaries, incomes from farms and other non-incorporated businesses, corporate profits, interest and rental incomes, and capital cost allowance
3. Value added–sum of the value added from each industry (value-added is total industry production net of the intermediate inputs used in production)

In this paper, we contrast the gross amount of exports in the first definition with the domestic incomes and value-added arising from exports alone in the second and third definitions, and we refer to the value-added or the incomes generated by exports interchangeably with the GDP arising from exports.

The regional IO model[6] consists of four matrices: the "make" or output matrix, the "use" or input matrix, the final demand matrix, and the inter-provincial "flows" matrix, which summarize yearly economic transactions in terms of more than 200 industries, 600 commodities, and 130 final demand categories. The output matrix "*V*" is a province by industry by commodity matrix that shows the industrial production of each commodity by province. The input matrix "*U*" is also a province by industry by commodity matrix that shows the commodities used by each industry as inputs (i.e. the intermediate goods and services required to produce output). The final demand matrix "*F*" is a province by final demand category by commodity matrix. The final demand categories include personal consumption, investment in fixed capital, government expenditures on goods and services, additions and withdrawals from inventories, and international exports and imports by commodity. The *flows* matrix is an origin by destination by commodity matrix that shows the inter-provincial exports and imports of commodities within Canada's borders.

The algebraic model used to generate the data for this paper is the basic IO model. Some definitions are required to illustrate the model.

t => a vector of total demand for commodities by region, derived from the F matrix

e^* => a vector of total exogenous demand for commodities excluding scrap, inventory withdrawals, exports and imports by region, also derived from the F matrix

q => a vector of total production of goods and services in each region, by commodity, derived from the output matrix

m => a vector of total imports of foreign goods and services, by commodity and by region, derived from the final demand matrix

g => a vector of total industry outputs, by region, derived from the input matrix

I => the identity matrix

D => the domestic market share matrix - a matrix of coefficients derived from the output matrix, that expresses the proportion of each commodity produced by each industry in each region

B => the industry technology matrix derived from the input matrix - it is assumed that the values of the inputs of each industry are fixed proportions of the value of the total output of the industry and are independent of the composition of the output. The production function of each industry by province is represented by matrix B.

R => matrix of coefficients derived from the *flows* matrix – R represents the proportion of a region's consumption of each commodity which satisfies the demand for domestic production. It reflects the inter-provincial flows of goods and services.

The model is now defined using the following identities:

1) $t = Bg + e^*$
2) $q = Rt$
3) $m = Mt$
4) $g = Dq$
5) $R + M = I$

The total supply and demand of commodities are summarized as:

$$q + m + scrap + invw = Bg + e^* + exp \qquad \text{(Equation D-1)}$$

---

[6] In the IO model, the "regions" consist of the ten provinces, the Yukon and Northwest Territories, and a "government abroad" region, which includes embassies, military bases, and the like (13 in all). The government abroad region was included in the calculations, but is not included in the paper.

where q is domestic production, m is the supply of imported commodities, *scrap* is the amount of recycled materials used in production, and *invw* denotes withdrawals from inventory, the total supply in the economy. The vector Bg is the demand for commodities used as production inputs, e^* is the final domestic demand for commodities, and *exp* is the foreign demand (exports), which together constitute total demand.

For purposes of this model, total domestic demand, t, is further divided into the demand for domestic production, R, and the demand for imported production, M, such that:

$$q + m + scrap + invw = R(Bg + e^*) + M(Bg + e^*) + exp \qquad \text{(Equation D-2)}$$

$R(Bg + e^*) + M(Bg + e^*)$ equal total domestic demand, t, and $R + M = 1$. Inventory withdrawals and scrap are excluded from this analysis.

Solving for g using the identities above, we substitute (4) and (2) into (1) which gives:

$$t = BDRt + e^* \qquad \text{(Equation D-3)}$$
$$t = (I - BDR)^{-1} e^* \qquad \text{(Equation D-4)}$$

Substituting (2) gives:

$$q = R(I - BDR)^{-1} e^* \qquad \text{(Equation D-5)}$$

Substituting (4) gives:

$$g^* = (I - BDR)^{-1} DRe^* \qquad \text{(Equation D-6)}$$

The vector e^* is a vector of final demand for commodities, excluding export demand. International exports are calculated as direct demands for the production of individual provinces, and are treated separately from other exogenous demands. The vector "x" represents each province's exports. The model is modified as follows:

$$g^* = (I - BDR)^{-1} D(Re^* + x) \qquad \text{(Equation D-7)}$$

The model is further divided such that:

$$g^{**} = (I - BDR)^{-1} Dx \qquad \text{(Equation D-8)}$$

Using this model, the direct and indirect effects of export sales on total production are calculated. For each region and for each export commodity, the value-added generated by exports sales is estimated for the exporting industry and for each industry that provides inputs into export production, by region. Then the ratio of inputs to GDP from all sources multiplied by the gross output generated by exports, g^{**}, gives for GDP at factor cost, and another at market price for each region by commodity and by the region supplying the inputs. These matrices show the GDP or incomes generated by each region's exports within its own borders and in the provinces from which its inputs originated. GDP at market price minus net indirect taxes equals GDP at factor cost.

To find the import content of exports, the following equations are used.

$$GDPMPX - GDPFCX = NIT \qquad \text{(Equation D-9)}$$

where GDPMPX is GDP arising from export production at market prices, GDPFCX is GDP generated by export production at factor cost, and NIT is the net indirect taxes levied on export sales. Net indirect taxes equal total indirect taxes (such as sales taxes) minus subsidies.

$$EXP - GDPMPX = IMP \qquad \text{(Equation D-10)}$$

where EXP is total exports and IMP is the import content of exports. This means that the total exports of each region minus the amount of income (at market prices) they generate domestically equals the amount of imported inputs required to produce the exports.

$$EXP = GDPMPX + IMP \quad \text{(Equation D-11)}$$
$$EXP = GDPFCX + IMP + NIT \quad \text{(Equation D-12)}$$

That is, total exports are equal to the incomes they generate domestically at factor cost, plus the foreign incomes arising from exports (imported inputs required for production), plus the net indirect taxes levied on the exports.

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